DEVELOPMENT OF INSULATED Cu WIRE STITCH BONDING

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Abstract: The market demands for higher pin counts and more chips functionality poses challenges in conventional wire bonding. However, the novel insulated Cu wire technology enables fine and ultra fine pitch wire bonding as the insulator coating on the bare wire prevents wires shorting problem. This paper present study on the stitch bonding process optimization and its challenges for the insulated Cu wire with the diameter of 20 µm. Insulated Cu stitch bond samples showed 37 % lower stitch pull strength than that of bare Cu. The cross-sectioned insulated Cu stitch bond shows that there are insulation residue between the Cu stitch and the Au plated substrate, potentially resulting lower stitch pull performance. However, after isothermal aging at 225 °C up to 78 hours, the stitch pull results for insulated Cu wire passed the industry reliability standard, without any lifted bond. A detailed comparison study was performed for the insulated Cu and the bare Cu stitch bonding.